

Environmental Database Integrated Product Team (EDB IPT) #2

Minutes

June 8, 2000

1. Background

a. COL Collier, IPT Chairman, welcomed the attendees (Enclosure 1) and presented a review of the mission and objectives of the IPT as well as some items of interest. Among the items of interest were:

i) The IPT will lose the leadership in one of the WIPTs. Ms. Deb Kabinier and Mr. Bernard Gajkowski will both be leaving their current positions and will no longer be able to co-chair the Features, Attributes, and Relationships (FAR) WIPT. Replacements are currently being coordinated.

ii) COL Collier also made mention of the funding for some of the projects associated with the IPT including \$.5 Million that DMSO has pledged in FY01.

iii) COL Collier proposed September 28, 2000 as the date for the next IPT, EDB IPT #3. He asked that Bernie Gajkowski host the meeting in Orlando.

2. NIMA Quality Review Process (Mr. Hampel, NIMA)

a. Mr. Hampel discussed NIMA's Quality Review Process to address a report of some errors in recent FFD production datasets. He described a Quality Review process that attempts to identify problems so that NIMA or its contractors can fix them before the data is released. His briefing, which included displays of imagery and vector data plots, showed that the reported errors were not errors but a true representation of the terrain. This led to a discussion about what is tested and what information about the tests is provided to the user. Mr. Hampel said that NIMA tests the road connectivity and slivers, among other items, and that NIMA can set the tolerance of the tests. He said that the user is not provided with a description of the test but he offered that the Army could send a representative to NIMA's biweekly Continuing Process Improvement meetings by contacting ODCSINT (LTC Loggins or Mr. Huisenga). Mr. Huisenga stated that the FFD specification is still a draft specification and that problems should be brought to the attention of ODCSINT.

b. During Mr. Hampel's presentation, it was suggested that NIMA use an Army-developed QC system (VPF-ES) to check terrain data anomalies. Mr. Hampel said that the NIMA lab is evaluating the software. He said that there appears to be duplication between the current NIMA validation software and the VPF-ES system and that NIMA has not yet decided which parts of the software may be used. He said that NIMA is also evaluating SEE-IT software for use in its quality review process.

c. Although the NIMA testing and the resulting test specifications coming out of production are important, it was suggested that it is also important to include error

reports as release notes. This is important because M&S developers end up spending unnecessary time finding problems of which NIMA is already aware. That's why it is important to provide the users with a list of the problems in the datasets. Mr. Hampel stated that NIMA provides a lineage document file (metadata) that comes with products. (See Enclosure 2 for more information about the lineage document file).

d. COL Collier made the point that the Army must have access to a complete, reliable set of correlated data. The alternative would be to continue to access NIMA FFD/MSDS data that requires M&S developers to value add because these products do not contain all of the feature and attribute data needed by M&S developers. In addition, once value adding is complete, the data must be maintained at another place awaiting NIMA validation. This system would perpetuate the current way of doing business resulting in continued high cost of developing M&S data and maintenance of redundant terrain databases.

3. Geospatial Framework (Ms. Kabinier, TEC)

a. The need for a common framework to identify environmental features, attributes, and relationships is critical to the progress of the IPT effort. Mr. Hampel said that NIMA is willing to put features and attributes in the framework that NIMA is currently using, which is based on the Digital Geographic Information Exchange Standard (DIGEST) Feature and Attribute Coding Catalog (FACC). However, M&S developers have found that the DIGEST FACC format does not enable them to include the features and attributes needed for M&S. This, among other reasons, is why the Terrain Common Data Model (TCDM) was developed. It is used for WARSIM and is being extended by STRICOM to other simulations. Mr Hampel explained that additional features and attributes could be submitted to NIMA for incorporation into the DIGEST FACC. Those features and attributes could then be used as U.S. extensions of the FACC until adopted into the DIGEST.

b. WARSIM TCDM is based on the Environmental Data Coding Specification (EDCS) which is going through the ISO standards process (ISO #18025). The has an established (subset) mapping to the DIGEST FACC. According to Mr. Shiflett, there is a method of going from FACC to EDCS and vice versa. It was also pointed out that FACC doesn't cover thermal imagery (as well as other non-mapping terrain attributes). This is becoming more important as the Army increases the amount of time it trains and fights in a low-light environment.

Issue #1 Which framework should the Army use to identify environmental features and attributes-the DIGEST FACC and UCDM or ISO EDCS and TCDM?

TASKER #1) FAR WIPT must recommend a framework. Ensure that representatives from C4I and NIMA are included as WIPT members. Ensure that the WIPT membership includes equal members of the topographic community, the M&S community, and the C4I community. Ms. Kabinier and Mr. Gajkowski (co-leads).

Issue #2 Further discussion revealed that WARSIM TCDM is little known outside the Army M&S community. Mr. Gajkowski, STRICOM, volunteered to provide education on TCDM. Mr. Shiflett volunteered to provide a copy of the extended TCDM. COL Pierce suggested that the briefing include a discussion of why the product that NIMA is currently providing doesn't meet the needs of the Army M&S community. And Mr. Carson, TRADOC, suggested that the TCDM education briefing be attended by the analysts who will be conducting the Features and Attributes COEA.

TASKER #2) Provide education on the WARSIM TCDM (and encompassing Common Framework) to IPT members and participants. Ensure education includes a discussion of why the product that NIMA is currently providing doesn't meet the needs of the Army M&S community. Mr. Gajkowski (lead).

TASKER #3) Provide copy of the SNE STO extended TCDM to interested persons. Mr. Shiflett (lead), Dr. Miller (assist).

4. Working Integrated Product Team Update Briefings

a. System and Process WIPT (COL Collier)

One Step Process (OSP) Projects – Mr. Huntley reviewed the SIMTECH and AMIP projects being pursued in support of the One Step Process. Among the objectives of the projects are the development of an OSP master plan; a user interface to specify terrain database requirements based on Master Environmental Library (MEL) and Environmental Scenario Generator (ESG); and the development of an M&S repository with direct links to NIMA's Web-based service. COL Collier requested that a C4I system be included when the Mr. Huntley develops the OSP master plan.

Geospecific/Typical Hybrid – Dr. Deliman presented a briefing on a proposed SIMTECH project to develop a geospecific and geotypical hybrid for generating and intensifying terrain databases to support M&S and C4ISR applications. These databases require significant feature and attribute characterization and there is limited availability of source data because of the mission or application, the region of interest, or time dependencies. In addition, procedures for value adding/data intensification are needed to provide expanded geospatial representation and to cover gaps within geospecific data provided by standard sources (e.g., NIMA). Dr. Deliman has proposed to utilize inference routines to generate terrain features and attributes based on available data, regional and local characteristics. The project will also employ various modeling techniques (e.g., statistical, physics-based, qualified) to generate a geospecific/typical hybrid that will provide timely solutions for missing and/or unavailable data.

3D Model Library – Mr. Rodriguez presented a briefing on a proposed SIMTECH project to develop and populate a virtual 3D model library. He briefed that there is no authoritative source for integrated 3D geotypical models that apply to full spectrum of M&S community. Nor is there a standard for 3D models supporting sensors (FLIR,

NVG, RF, etc.), weapons (breaching, etc.) and individual combatants (buildings, clearing). Mr. Rodriguez plans to leverage the existing SNE STO TCDM Framework and ongoing extension and look at existing data models and meld with future requirements. It is planned that the 3D library effort be coordinated with the effort on the BRL-CAD survivability models, the Air Force, and CECOM's Night Vision Labs, among other Army and Joint model development organizations. It was recognized that construction materials for models of buildings are an important part of the 3D library effort. COL Collier directed that Mr. Rodriguez make this a priority and that CECOM be included in the evaluation. It was also suggested that the effort be coordinated with other organizations that have model libraries, including STRICOM PM-ITTS and the Threat Model Office. There was also a discussion about the need for a range of models since not all users require models of equal sophistication. Other suggestions included approaching former Eastern Bloc countries as they are very interested in models and may pay for the development of some models, and the creation of a web site that would link sources of models vice a single model library. It was suggested that the metadata be included with each model. COL Collier also asked this team to ensure that their FY01 efforts result in establishing a library and actually putting reusable 3-D models on the shelf and that they use previously generated GOTS and COTS models.

b. Technology WIPT (Ms. Woodard)

The WIPT objectives include the development of a remote access mechanism for environmental databases; the promotion of common dynamic environmental representations; and recommended environmental data solutions based on geo-typical products/data elements that can be produced to support operational requirements. Their efforts will establish standardized data processing procedures that reduce key problems associated with current environmental databases such as thinning, correction, and alignment of data and merging, and adding data. The WIPT will work on objectives through AMIP/SIMTECH/SCC funding and by leveraging tech-based funding from STRICOM and ERDC/TEC.

c. Policy WIPT (MAJ Doescher)

MAJ Doescher discussed the first meeting of the Policy WIPT and some of the possible policy issues associated with the IPT effort. Two issues were the responsibility for the value-added data awaiting NIMA certification and the security classification level of geospatial data. However, these issues will need to be discussed more before a policy can be formulated. Mr. Shiflett suggested that there is no process to provide back to NIMA terrain data that has been corrected or enhanced. However, LTC Loggins said that NIMA is moving in that direction. This prompted a discussion about the integration and management of terrain data and the possible need for a master data manager. It was suggested that the policy group take a look at how do we integrate all the data that's available to make it useful.

d. Features, Attributes, and Relationships (FAR) WIPT (Ms. Kabinier)

The objectives of the FAR WIPT include establishing a Joint Environmental Data Framework (JEDF), to include coverages, features, attributes, & relationships and then expanding the initial framework to include ocean, atmosphere, space and other environmental domains. The WIPT plans to accomplish these objectives by determining the requirements (commonalities and differences) amongst the various models; defining standard data models from the Joint Framework; and conducting a COEA.

5. Army's Digital Terrain Data Requirements (LTC Loggins)

a. LTC Loggins briefed that without change, NIMA cannot support a CONUS based contingency force. Their plan is to migrate to an information environment through the use of a concept that consists of Qualified Data (QD); Foundation Data (FD); and Mission-Specific Data Sets (MSDS). This is a readiness and responsiveness concern for the Army. In an effort to improve the product, TPIO-TD has requested the addition of features like pipelines and power plants and features like the aqueduct width and Military Load Classification (MLC) for bridges. In addition, NIMA must invest in technology to derive bare earth elevation.

b. LTC Loggins briefed that NIMA must develop/refine automated tools for quality control. NIMA products must be spatially correct, i.e.; rivers must connect to rivers; and roads must connect to roads; rivers and streams must flow downhill; and the elevation of lakes and reservoirs should be constant. The Army has requested that NIMA define MSDS request procedures; that they must be Web-based; and that they must prove "just in time" for exercise support.

c. Another very important issue is the establishment of a feedback mechanism from the terrain data user to NIMA. It is critical so the field can have the ability to quickly and easily provide quality and accuracy observations. LTC Loggins said that although the Army has accepted the Foundation Data Concept, we must continue to work with NIMA to implement the concept so that it meets the Army's requirements.

6. Detailed Urban Feature Data Extraction (Dr. Bethel)

Dr. Bethel provided an overview of the collaborative project sponsored by Marconi USC Purdue 3D Information (MURI) to advance the rapid and affordable generation of terrain and detailed urban feature data toward the construction of geospatial databases. Goals of the project include the increase of speed and quality; the reduction of development time and effort; and the transfer of technology to NIMA and Army Labs. The project centers on the fusion of data from multiple sources including Hy-Map Sensor data, thematic maps, hyperspectral images, DEM and 3D linear features. This is developmental work that shows promise in speeding up the extraction process.

7. Urban Terrain Zones (Mr. Vitti)

Mr. Vitti described a project to establish an Urban Information System that characterizes relevant urban areas worldwide through the use of the Urban Terrain Zone (UTZ) classification system, a methodology developed by Dr. Richard Ellefsen of San Jose State University. The focus of the project is to build a foundation of geospatial data to support urban analysis. The project built a web-based interface to a wide variety of urban area data supporting intelligence analysis and operational planning at <http://136.197.224.135/homepage/ims/imsconnect.html>. The UTZ Universal Model includes attributes based on the geographic location of the building that can be used for cost - surface trafficability, network/route analysis, line of sight analysis, and urban assault planning, among others. Mr. Vitti also distributed copies of his report.

8. COL Collier thanked all the meeting participants for attending the IPT. He said that he is committed to creating an environment of cooperation and coordination. He will establish email reflectors for the EDB IPT as well as for each WIPT and will provide better on-line support including a master event calendar. He also talked about the purpose of IPT implementation memorandums that the IPT should publish periodically to forward ideas and to add impetus to initiatives. He also stated that a major effort between now and the next IPT should be refinement of the four AMIP and SIMTECH project proposals. The proposals need to be well developed in order to successfully compete in the funding process.

9. The POC for these minutes is Al Taylor, IITRI/ABTechnologies Group, Army Model and Simulation Office, (703) 601-0010, ext 22, allen.taylor@hqda.army.mil.



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Encls

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2 – VPF Metadata Information

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Enclosure 2 (VPF Data Metadata Information) to Environmental Database Integrated Product Team (EDB IPT) #2 Minutes, June 8, 2000

The VPF data structure allows for metadata to be input at all levels within the data. As such, NIMA has utilized this capability to provide users with information regarding assumptions and interpretations, to describe source deficiencies, and to explain conventions that have been adopted during production. Generally, the metadata may be found at the level most appropriate to that particular information, i.e., the metadata can reside:

1. within the lineage.doc,
2. within the Data Quality Coverage,
3. as a Data Quality feature within a coverage, or
4. as a document file associated with a coverage, table or column.

The Data Quality Coverage describes the sources used to create the library. Data quality features are associated with specific features within any coverage and describe conditions not fully addressed by the attribute choices. Most commonly, data quality features will highlight uncertainties related to alignment or placement for the given feature. Data quality area features will most commonly describe areas void of some information. For example, for "Contour Lines in the Elevation Coverage" the lineage.doc is a metadata file at the data library level that allows free text entry. NIMA utilizes the lineage.doc to describe production methodology including library specific problems and resolutions. Document files may describe collection strategies and will be found at the feature table level. Document files may also describe conventions used when populating specific attributes and are associated with columns within tables.